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10/801,073	03/15/2004	Evren Eryurek	R11.12-0822	1263

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EXAMINER

HUYNH, PHUONG

ART UNIT	PAPER NUMBER
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2857

DATE MAILED: 08/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/801,073	ERYUREK ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Phuong Huynh	2857	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 March 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-82 is/are pending in the application.
- 4a) Of the above claim(s) 1-32, 38, 43-45, 53, 54, 69, 70 and 72-81 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 58-68 and 71 is/are allowed.
- 6) ☒ Claim(s) 33-36, 38-42, 46-52 and 55-57 is/are rejected.
- 7) ☒ Claim(s) 37 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>08/04/04 ; 11/03/04 ; 10/25/04</u>  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election **with traverse** of Species 3, Figure 5, claims 1-82 in the reply filed on April 25, 2006 is acknowledged. Because Applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election **without traverse** (see MPEP § 818.03(a)).

Claims 1-32, 38, 43-45, 53, 54, 69, and 72-81 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species of Figures 3 and 4, respectively; there being no allowable generic or linking claim.

- Independent claim 1 recites "an analog to digital converter (ADC)" [claim 1, lines 6-10], and "a microprocessor system [claim 1, lines 11-13], wherein said ADC and said microprocessor system are found in **Figure 3** [element numbers 84 and 88 respectively], not in Figure 5."
- Independent claim 19 recites "a diagnostic circuit configured to receive the trained output and the monitor output and generate a diagnostic output indicating a current condition of the impulse line" [claim 19, lines 19-23], which is the diagnostic output in Figure 4 while the diagnostic output 62 in Figure 5 indicates a condition of the primary element [see Specification: pg. 11, lines 8-11; also see Specification: pg. 8, lines 15-20 for recitation of "primary element" and "impulse line"].

- Dependent claims 38, 54 and 70 recite “the current data set and historical data comprise time domain data,” which is specifically disclosed in Figure 4 [see Specification: pg. 8, line 30-pg. 9, lines 1-3].
- Dependent claim 43 recites “a method of diagnostic wherein the current data set comprises current data on the sample average ( $X$ ) and sample deviation ( $s$ ) of the calculated difference,” which is the method specifically used in Figure 4 [see element 46 in Figure 4; and Specification, at pg. 10, lines 19-pg. 11, lines 1 and 2].

Claim 43 depends directly from claim 44 is also withdrawn from further consideration.

- Dependent claim 45 recites “the method of diagnostic wherein the sample deviation ( $s$ ) is compared to the standard deviation ( $\sigma$ ) to diagnose impulse line plugging which is used in Figure 4 [see element 46, Figure 4 and Specification, at pg. 10, lines 19-pg. 11, lines 1 and 2].
- Similarly, dependent claims 53 and 64 recites “the diagnostic output provides a predictive indication of a future of plugging of the impulse line,” and “the baseline impulse piping is related to substantially new impulse piping,” which is used in Figure 4 [see element 46, Figure 4 and Specification, at pg. 10, lines 19-pg. 11, lines 1 and 2].

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- Independent claim 72 recites “a method for detecting a degrading of impulse piping used to couple to a pressure transmitter to a process fluid in a process control system,” which is a method specifically used as disclosed in Figure 4, not in Figure 5 [see Specification: pg. 10, lines 19-pg. 11, lines 1 and 2].

Therefore, claims 1-32, 38, 43-45, 53, 54, 64, 69, 70 and 72-81 are withdrawn from further consideration.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

The requirement is still deemed proper and is therefore made FINAL.

### ***Priority***

2. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 120 as follows:

This application is claiming the benefit of prior-filed nonprovisional applications No. 08/623,569 (patented on January 25, 2000), 08/383,828 (patented on November 25, 2003), and 09/257896 (Abandoned March 21, 2002) under 35 U.S.C. 120, 121, or 365(c). Copendency between the current application and the prior application is required. Since the applications are not copending, the benefit claim to the prior-filed nonprovisional application is improper. Applicant is required to delete the reference to the prior-filed application from the first sentence(s) of the specification, or the application data sheet, depending on where the reference was originally submitted, unless applicant can establish copendency between the applications.

### ***Drawings***

3. Figures 18-22A and 22B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

4. Claims 33, 40, 41, and 56-58 are objected to because of the following informalities:

Regarding claim 33, at lines 19; *claim 41*, at lines 17 and 18; *claim 56*, at lines 19 and 20; *claim 57*, line 19; and claim 58, lines 22 and 23, "and/or an impulse line" should be deleted so as to prevent claims 33 and 41 and their dependent claims being further withdrawn as being drawn to a non-elected Species, Figure 4, since "a diagnostic output, indicative of a condition of a condition of an impulse line of the pressure transmitter, [is generated]" [see Specification: pg. 11, lines 8-11; also see Specification: pg. 8, lines 15-20 for recitation of "primary element" and "impulse line"].

Claim 33, "fluid flow meter" lacks proper antecedent basis because there is no "fluid flow meter" mentioned previously.

Claim 40, "the flow meter," and "the diagnostic current" lack proper antecedent basis because there are no "fluid flow meter" and "diagnostic current" mentioned previously in claim 33 which claim 40 depends directly from.

Claim 47, line 2, insert -- data on -- after "comprises".

Appropriate correction is required.

### ***Double Patenting***

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the

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conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 33-35, 40 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 21, 35 and 37 of U.S. Patent No. 6,654,697 (hereinafter "697") in view of U.S. Patent No. 6,907,383 (hereinafter "383").

Regarding claim 33, '697 recites a transmitter adapted to measure process flow, comprising:

a pressure sensor adapted to sense pressure of **a process fluid**

Although the conflicting claims are not identical, and that '697 does not explicitly recites the limitation "to sense pressure of **a process fluid**," they are not patentably distinct from each other because it recites that "pressure transmitter adapted to couple to a primary flow element via impulse line to sense flow," and that "the pressure transmitter comprises a differential pressure adapted to couple to the impulse lines to sense a pressure" [see '697 at claim 21, lines 1-5], for which it is the Examiner's position that '697 recites the claimed "a pressure transmitter adapted to sense pressure of a process fluid" since pressure transmitters are used in industrial process control



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environments and couple to the process fluid through impulse line. Pressure measurements can be used to measure flow, or level” [see Application’s Specification: page 1, lines 17-20].

a difference circuit coupled to the sensor and configured to generate a difference output representing the sensed pressure minus a moving average [see ‘697: claim 21, lines 8-10];

a calculate circuit configured to receive the difference output and calculate a trained output of historical data obtained during training and to calculate a monitor output of current data obtained during monitoring [see ‘697: claim 21, lines 11-14];

‘697 recites that a diagnostic circuit, receiving the trained output and the monitor output [see claim 21, lines 15 and 16], but ‘697 does not disclose the limitation “generate a diagnostic output indicative of a condition of a primary element and/or an impulse line of the transmitter”(emphasis added).

‘383 teaches a diagnostic report indicating the condition of one of the group consisting of the primary element and impulse line [see ‘383: col. 3, lines 3-5; and col. 7, lines 20-22].

It would have been obvious to one of ordinary skill in the art at the time of Applicant’s invention to modify the invention of ‘697 to include the generation of a diagnostic indicating condition of the primary element and/or impulse line, as taught by ‘383, to provide a diagnostic application which is downloadable from an application service provider and can run on the control system, and a remote computer [see ‘383: Abstract, lines 7-13].

Regarding claim 34, '697 recites that "the historical data set comprises data on the power spectral density of the calculated difference" [see '697: claim 35, lines 1-3].

Regarding claim 35, '697 recites a differential pressure sensor [see '697: claim 21, line 4].

Claim 39 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 37 of U.S. Patent No. 6,654,697. Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 37 of US Patent No. 6,654,697 recites an algorithm selected from wavelets, and Fourier Transform which recites the claimed "frequency domain data."

Regarding claim 40, '697 recites that "a diagnostic algorithm selected from the group of algorithms consisting of neural networks, fuzzy logic, wavelets, and Fourier transforms" [see '697: claim 37].

Claim 36 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 21 of U.S. Patent No. 6,654,697 in view of Warrior (US Patent No. 5,960,375).

Regarding claim 36, US Patent No. 6,654,697 does not recite that "the pressure sensor comprises an absolute pressure sensor"

Warrior teaches absolute pressure sensor 54B of a pressure transmitter [see Warrior: col. 3, lines 42-45].

It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the invention of US Patent No. 6,654,697 to include the absolute pressure sensor, as taught by Warrior, so as to compensate for errors in the digitized signal representing differential pressure with the digitized signals representing absolute pressure [see Warrior: col. 3, lines 63-65].

Claims 41, 42, 46-49 and 51 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 21 of U.S. Patent No. 6,654,697 (hereinafter "697")

Regarding claims 41, '697 recites a diagnostic method for diagnosing a pressure transmitter coupled to a process fluid, the method comprising:

calculating a difference between a pressure sensed by the pressure transmitter and moving average of the sensed pressure [see '697: claim 59, lines 4-6];

acquiring and storing an historical data set of the calculated difference during a train mode of the pressure transmitter[see '697: claim 59, lines 7-9];

acquiring and storing a current data set of the calculated difference during a monitoring mode of the pressure transmitter[see '697: claim 59, lines 10-13]; and

comparing the current data set to the historical data set to diagnose the condition of a primary element and/or an impulse line of the pressure transmitter [see '697: claim 59, lines 14-16].

Regarding claim 42, '697 recites that "the historical data set comprises statistical data on the calculated difference [see '697: claim 60].

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Regarding claim 46, '697 recites that "the historical data set comprises data on the power spectral density of the calculated difference [see '697: claim 64].

Regarding claim 47, '697 recites that "the current data set comprises data on power spectral density of the calculated difference" [see '697: claim 65].

Regarding claim 48, '697 recites that "the comparing includes performing a diagnostic algorithm selected from the group of algorithms consisting of neural networks, fuzzy logic, wavelets, and Fourier transforms [see '697: claim 66].

Regarding claim 49, '697 recites that "the transmitter configured to perform the method of claim 41 [see '697: claim 59 for "the transmitter" at line 1].

Claim 50 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 59 of U.S. Patent No. 6,654,697 in view of Eryurek et al. (US Patent No. 5,828,567).

Regarding claim 50, US Patent No. 6,654,697 does not disclose control room equipment.

Eryurek et al. discloses output circuitry coupled to a process control loop transmits residual life of the sensor [see Abstract, lines 8-10]. Although, Eryurek et al. does not explicitly disclose the control room equipment, it is the Examiner's position that the output circuitry coupled to a process loop transmits residual

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life of the sensor, as taught by Eryurek et al., meets the claimed "control room equipment" so as to control the process and transmit residual life of the sensor.

It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the invention of US Patent No. 6,654,697 to include the rules, as taught by Eryurek et al., to use it during training to generate the trained values, and to generate the statistical parameters for use by the rules [see Eryurek et al.: col. 8, lines 1-7].

Regarding claim 51, although the conflicting claims are not identical, they are not patentably distinct from each other because claim 59 of US Patent No. 6,654,697 recites that "calculating a difference between a pressure sensed" [see '697: claim 59, lines 4-6], which implicitly recites "a differential pressure."

Claim 52 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 59 respectively of U.S. Patent No. 6,654,697 in view of Warrior (US Patent No. 5,960,375).

Regarding claim 52, US Patent No. 6,654,697 does not recite that "the pressure sensor comprises an absolute pressure sensor"

Warrior teaches absolute pressure sensor 54B of a pressure transmitter [see Warrior: col. 3, lines 42-45].

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It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the invention of US Patent No. 6,654,697 to include the absolute pressure sensor, as taught by Warrior, so as to compensate for errors in the digitized signal representing differential pressure with the digitized signals representing absolute pressure [see Warrior: col. 3, lines 63-65].

Claim 55 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 59 respectively of U.S. Patent No. 6,654,697. Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 66 of US Patent No. 6,654,697 recites an algorithm selected from wavelets, and Fourier Transform which recites the claimed "frequency domain data."

Claim 56 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 67 of U.S. Patent No. 6,654,697 (hereinafter "697")

Regarding claim 56, '697 recites that "computer-readable medium having stored thereon instructions executable by a microprocessor system to cause the microprocessor system to perform a diagnostic operation on a pressure transmitter coupled to a process fluid, the instructions comprising:

calculating a difference between a pressure sensed by the pressure transmitter and a moving average of the sensed pressure [see '697: claim 67, lines 1-9];

acquiring and storing an historical data set of the calculated difference during a train mode of the pressure transmitter [see '697: claim 67, lines 10-12];

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acquiring and storing a current data set of the calculated difference during a monitoring mode of the pressure transmitter [see '697: claim 67, lines 13-15]; and

comparing the current data set to the historical data set to diagnose the condition of a primary element and/or an impulse line of the pressure transmitter [see '697: claim 67, lines 16-18].

Claim 57 rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 21 of U.S. Patent No. 6,654,697 (hereinafter "697").

Regarding claim 57, '697 recites "a pressure transmitter adapted to couple to a process fluid to sense process pressure, the pressure transmitter comprising:

a pressure sensor for sensing process pressure [see '697: claim 21, lines 1-5];

differencing means for generating a difference output representing the sensed pressure minus a moving average [see '697: claim 21, lines 8-10];

calculating means for receiving the difference output for calculating a trained output of historical data obtained during training and for calculating a monitor output of current data obtained during monitoring [see '697, claim 21, lines 11-14]; and

diagnosing means for receiving the trained output and the monitor output, generating a diagnostic output and diagnosing a current condition of a primary element and/or an impulse line of the pressure transmitter [see '697: claim 21, lines 15-18].

***Allowable Subject Matter***

6. Claim 37 would be allowable if rewritten to overcome the rejection(s) under Double Patenting, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claims 58, 64-68 and 71 are allowed.

The following is an examiner's statement of reasons for allowance:

Regarding claim 58, the prior art of record fails to disclose the following claim limitation:

"a pressure transmitter coupled to a process control loop and providing an output related to a pressure of process fluid,"

or "a memory adapted to contain a baseline statistical parameter of the pressure sensor output,"

Claims 59-68 and 71 are also allowed as being dependent directly/indirectly upon claim 58.

***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuong Huynh whose telephone number is 571-272-2718. The examiner can normally be reached on M-F: 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc Hoff can be reached on 571-272-2216. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

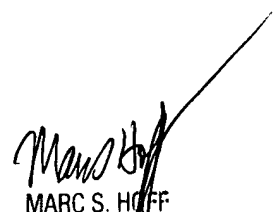


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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Phuong Huynh  
Examiner  
Art Unit 2857

PH  
08/01/2006



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